10 May 1957

Dr. W. F. Libby
Atomic Energy Commission
Washington, D.C.

Dear Bill:

I am glad to give you the information that you have requested in your letter of 2 May.

First, I must say that the speech that I gave in Chicago was not on radioactive fall-out. It was a talk to the Chicago Section of the American Chemical Society on abnormal hemoglobins in relation to disease. Toward the end of the talk I said that the progress of medicine in the treatment of individuals with defective genes causing disease such that they would die if they were not given medical treatment would in the course of time lead to a deterioration of the pool of human germ plasm. I mentioned that bad genes are produced afresh from time to time by cosmic rays and other mutagenic agents, including a very small relative effect of fall-out radiation, and that if we did not allow the individuals who inherited the bad genes in double dose to die, but kept them alive and healthy, the steady-state concentration would increase. This was the only reference to this matter in my talk.

After the talk was over several people came up to me and asked questions about the magnitude of the radiation effect due to fall-out. I said that this effect was very small compared with other effects, perhaps one percent, but that in an absolute sense it could have some damaging effect on individuals - that I had made the estimate that there would be 1000 deaths from leukemia if another superbomb were detonated by the British this summer. One man then stated that he was a reporter. The American Chemical Society people told me that reporters never came to this meeting, but the meeting at which I spoke provided an exception to this generalization.

I have made use of a large amount of published information and information that I have obtained by listening to lectures, for example by Professor Hardin Jones of the University of California at Berkeley, in forming my own estimates of biological effects of radiation, including fall-out radiation.

I find that my statement that I estimated that a thousand deaths from leukemia would result from another superbomb detonation (5 megatons of fission) was based upon some calculations that I had made using information given in a manuscript by E. B. Lewis. I may

say that I had not intended to make a public announcement of this estimate - I was talking to only a few people, and I did not know that one of them was a reporter. The estimate can be made in the following way. According to Professor Lewis, strontium-90 in 0.001 MPC (0.2 r/year) would cause, during the lifetime of the individual, an incidence of 5×10^{-6} of leukemia, which, for a population of 2×10^{9} would be 10,000 cases. I considered 0.001 MPC as being the average effect over the lifetimes of the individuals affected from 50 megatons of fission, and took one tenth of this for a single superbomb, giving 1000 as the result of our calculation.

0.002

I am sure that Professor Lewis could give you details of his arguments that are not contained in the copy of his manuscript that has been, I understand, sent to your office.

If you have any questions about the other estimates that I have made and publicly announced, please let me know.

Sincerely yours,

Linus Pauling:w

cc: Prof. Beadle
Prof. Brown
Prof. Lewis